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**PHILOSOPHICAL
TRANSACTIONS**

OF THE

ROYAL SOCIETY

OF

LONDON.

FOR THE YEAR MDCCCXXXIV.

PART I.

LONDON:

PRINTED BY RICHARD TAYLOR, RED LION COURT, FLEET STREET.

MDCCCXXXIV.

ADVERTISEMENT.

THE Committee appointed by the *Royal Society* to direct the publication of the *Philosophical Transactions*, take this opportunity to acquaint the Public, that it fully appears, as well from the council-books and journals of the Society, as from repeated declarations which have been made in several former *Transactions*, that the printing of them was always, from time to time, the single act of the respective Secretaries, till the Forty-seventh Volume: the Society, as a Body, never interesting themselves any further in their publication, than by occasionally recommending the revival of them to some of their Secretaries, when, from the particular circumstances of their affairs, the *Transactions* had happened for any length of time to be intermitted. And this seems principally to have been done with a view to satisfy the Public, that their usual meetings were then continued, for the improvement of knowledge, and benefit of mankind, the great ends of their first institution by the Royal Charters, and which they have ever since steadily pursued.

But the Society being of late years greatly enlarged, and their communications more numerous, it was thought advisable that a Committee of their members should be appointed, to reconsider the papers read before them, and select out of them such as they should judge most proper for publication in the future *Transactions*; which was accordingly done upon the 26th of March 1752. And the grounds of their choice are, and will continue to be, the importance and singularity of the subjects, or the advantageous manner of treating them; without pretending to answer for the certainty of the facts, or propriety of the reasonings, contained in the several papers so published, which must still rest on the credit or judgement of their respective authors.

It is likewise necessary on this occasion to remark, that it is an established rule of the Society, to which they will always adhere, never to give their opinion, as a Body,

upon any subject, either of Nature or Art, that comes before them. And therefore the thanks, which are frequently proposed from the Chair, to be given to the authors of such papers as are read at their accustomed meetings, or to the persons through whose hands they received them, are to be considered in no other light than as a matter of civility, in return for the respect shown to the Society by those communications. The like also is to be said with regard to the several projects, inventions, and curiosities of various kinds, which are often exhibited to the Society ; the authors whereof, or those who exhibit them, frequently take the liberty to report and even to certify in the public newspapers, that they have met with the highest applause and approbation. And therefore it is hoped that no regard will hereafter be paid to such reports and public notices ; which in some instances have been too lightly credited, to the dishonour of the Society.

C O N T E N T S.

- I. *On the Quantity and Quality of the Gases disengaged from the Thermal Spring which supplies the King's Bath in the City of Bath.* By CHARLES DAUBENY, M.D. F.R.S. Professor of Chemistry in the University of Oxford page 1
- II. *On the Empirical Laws of the Tides in the Port of London; with some Reflexions on the Theory.* By the Rev. WILLIAM WHEWELL, A.M. F.R.S. Fellow and Tutor of Trinity College, Cambridge 15
- III. *On the Position of the North Magnetic Pole.* By Commander JAMES CLARK ROSS, R.N. F.R.S. F.R.A.S. F.L.S. &c. 47
- IV. *Notice as to the supposed Identity of the large Mass of Meteoric Iron now in the British Museum, with the celebrated Otumpa Iron described by RUBIN DE CELIS in the Philosophical Transactions for 1786. Communicated in a Letter from WOODBINE PARISH, Esq. F.R.S. to CHARLES KÖNIG, Esq. Foreign Secretary of the Royal Society* 53
- V. *Experimental Researches in Electricity.—Sixth Series.* By MICHAEL FARADAY, D.C.L. F.R.S. Fullerian Prof. Chem. Royal Institution, Corr. Memb. Royal and Imp. Acadd. of Sciences, Paris, Petersburg, Florence, Copenhagen, Berlin, &c. &c. 55
- VI. *Experimental Researches in Electricity.—Seventh Series.* By MICHAEL FARADAY, D.C.L. F.R.S. Fullerian Prof. Chem. Royal Institution, Corr. Memb. Royal and Imp. Acadd. of Sciences, Paris, Petersburg, Florence, Copenhagen, Berlin, &c. &c. 77
- VII. *On the Theory of the Moon.* By JOHN WILLIAM LUBBOCK, Esq. V.P. and Treas. R.S. 123
- VIII. *On the Theory of the Moon.* By JOHN WILLIAM LUBBOCK, Esq. V.P. and Treas. R.S. 127

IX.	<i>On the Tides.</i>	By JOHN WILLIAM LUBBOCK, Esq. V.P. and Treas. R.S.	143
X.	<i>On the Nature of Death.</i>	By A. P. W. PHILIP, M.D. F.R.S. L. & E. &c.	167
XI.	<i>An Account of a Concave Achromatic Glass Lens, as adapted to the Wired Micrometer when applied to a Telescope, which has the property of increasing the magnifying power of the Telescope without increasing the diameter of the Micrometer Wires.</i>	By GEORGE DOLLOND, F.R.S. &c.	199
XII.	<i>On the Principle of Construction and general Application of the Negative Achromatic Lens to Telescopes and Eyepieces of every description.</i>	By PETER BARLOW, Esq. F.R.S. &c.	205
XIII.	<i>Some Suggestions relative to the best Method of employing the New Zenith Telescope lately erected at the Royal Observatory.</i>	By JOHN POND, Esq. A.R. F.R.S.	209

APPENDIX.

Meteorological Journal kept at the Apartments of the Royal Society, by order of the President and Council.

A List of Public Institutions and Individuals, entitled to receive a copy of the Philosophical Transactions of each year, on making application for the same directly or through their respective agents, within five years of the date of publication.

In the British Dominions.

The King's Library.
The British Museum.
Sion College Library.
The Bodleian Library, Oxford.
The Radcliffe Library, Oxford.
The Cambridge University Library.
The Edinburgh College Library.
Advocates' Library, Edinburgh.
The University of Glasgow.
The University of Aberdeen.
The University of St. Andrews.
The University of Trinity College, Dublin.
The Library of King's Inn, Dublin.
The Royal College of Physicians.
The Society of Antiquaries.
The Linnean Society.
The Royal Institution of Great Britain.
The Society for the Encouragement of Arts.
The Geological Society.
The Horticultural Society.
The Royal Astronomical Society.
The Royal Asiatic Society.
The Medical and Chirurgical Society.
The London Institution.
The Cambridge University Philosophical Society.
The Royal Society of Edinburgh.
The Royal Irish Academy.
The Royal Dublin Society.
The Asiatic Society at Calcutta.
The Royal Artillery Library at Woolwich.
The Royal Observatory at Greenwich.
The Observatory at Dublin.
The Observatory at Armagh.
The Observatory at the Cape of Good Hope.
The Observatory at Madras.
The Observatory at St. Helena.
The Observatory at Paramatta.

Denmark.

The Royal Society of Sciences at Copenhagen.
The Royal Observatory at Altona.

France.

The Royal Academy of Sciences at Paris.
The Royal Academy of Sciences at Thoulouse.
The *E'cole des Mines* at Paris.
The Geographical Society at Paris.
The Entomological Society of France.

Germany.

The University at Göttingen.
The Cæsarean Academy of Naturalists at Bonn.
The Observatory at Manheim.

Italy.

The Italian Society of Sciences at Modena.
The Royal Academy of Sciences at Turin.

Switzerland.

The *Société de Phys. et d'Hist. Nat.* at Geneva.

Belgium.

The Royal Academy of Sciences at Brussels.

Spain.

The Royal Observatory at Cadiz.

Portugal.

The Royal Academy of Sciences at Lisbon.

Prussia.

The Royal Academy of Sciences at Berlin.

Russia.

The Imperial Academy of Sciences at St. Petersburg.

Sweden and Norway.

The Royal Academy of Sciences at Stockholm.
The Royal Society of Sciences at Drontheim.

United States.

The American Philosophical Society at Philadelphia.
The New York Philosophical Society.
The American Academy of Sciences at Boston.
The Library of Harvard College.
The fifty Foreign Members of the Royal Society.

A List of Public Institutions and Individuals, entitled to receive a copy of the Astronomical Observations made at the Royal Observatory at Greenwich, on making application for the same directly or through their respective agents, within five years of the date of publication.

In the British Dominions.

The King's Library.
The Board of Ordnance.
The British Museum.
The Royal Society.
The Bodleian Library, Oxford.
The Savilian Library, Oxford.
The Library of Trinity College, Cambridge.
The King's Observatory at Richmond.
The Royal Observatory at Greenwich.
The University of Aberdeen.
The University of St. Andrews.
The University of Dublin.
The University of Edinburgh.
The University of Glasgow.
The Observatory at Oxford.
The Observatory at Cambridge.
The Observatory at Dublin.
The Observatory at Armagh.
The Observatory at the Cape of Good Hope.
The Observatory at Paramatta.
The Observatory at Madras.
The Observatory at St. Helena.
The Royal Astronomical Society.
The Royal Institution of Great Britain.
The Royal Society, Edinburgh.
The Astronomical Institution, Edinburgh.
The President of the Royal Society.
The Lowndes's Professor of Astronomy, Cambridge.
The Plumian Professor of Astronomy, Cambridge.
The Lord Bishop of Cloyne.
Francis Baily, Esq.
Thomas Henderson, Esq. of Edinburgh.
The Rev. Thomas John Hussey.
John William Lubbock, Esq. V.P. and Treas. R.S.
Captain W. H. Smyth, R.N. of Bedford.
Sir James South, Observatory, Kensington.

Lieutenant Stratford, R.N.
Mr. Thomas Taylor, Greenwich.
Edward Troughton, Esq.

In Foreign Countries.

The Royal Academy of Sciences at Berlin.
The Royal Academy of Sciences at Paris.
The Imperial Academy of Sciences at St. Petersburg.
The Royal Academy of Sciences at Stockholm.
The Royal Society of Sciences at Upsal.
The Board of Longitude of France.
The University of Göttingen.
The University of Leyden.
The Academy of Bologna.
The American Academy of Sciences at Boston.
The American Philosophical Society at Philadelphia.
The Library of Harvard College.
The Observatory at Åbo.
The Observatory at Altona.
The Observatory at Berlin.
The Observatory at Brussels.
The Observatory at Cadiz.
The Observatory at Coimbra.
The Observatory at Copenhagen.
The Observatory at Dorpat.
The Observatory at Königsberg.
The Observatory at Mannheim.
The Observatory at Marseilles.
The Observatory at Milan.
The Observatory at Palermo.
The Observatory at Paris.
The Observatory at Seeberg.
The Observatory at Vienna.
The Observatory at Wilna.
Professor Bessel, of Königsberg.
Dr. William Olbers, of Bremen.

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PART II.

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MDCCCXXXIV.

ROYAL MEDALS.

HIS MAJESTY KING WILLIAM THE FOURTH, in restoring the Foundation of the Royal Medals, graciously Commanded a Letter, of which the following is an extract, to be addressed to the Royal Society, through His Royal Highness the Duke of Sussex, K.G., President :

“ Windsor Castle, March 25, 1833.

“ It is His Majesty’s wish,—

“ First, That the Two Gold Medals, value of Fifty Guineas each, shall henceforth be awarded on the day of the Anniversary Meeting of the Royal Society, on each ensuing year, for the most important discoveries in any one principal subject or branch of knowledge.

“ Secondly, That the subject matter of inquiry shall be previously settled and propounded by the Council of the Royal Society, three years preceding the day of such award.

“ Thirdly, That Literary Men of all nations shall be invited to afford the aid of their talents and research : and,

“ Fourthly, That for the ensuing three successive years, the said Two Medals shall be awarded to such important discoveries, or series of investigations, as shall be sufficiently established, or completed to the satisfaction of the Council, within the last five years of the days of award, for the years 1834 and 1835, including the present year, and for which the Author shall not have previously received an honorary reward.”

(Signed) “ H. TAYLOR.”

The Council propose to give one of the Royal Medals in the year 1836, to the most important unpublished paper in Astronomy, communicated to the Royal Society for

insertion in their Transactions, after the present date and prior to the month of June in the year 1836.

The Council also propose to give one of the Royal Medals in the year 1836 to the most important unpublished paper in Animal Physiology, communicated to the Royal Society for insertion in their Transactions, after the present date and prior to the month of June in the year 1836.

The Royal Medals for the year 1833 were awarded to

SIR JOHN FREDERICK WILLIAM HERSCHEL, K.H. F.R.S.,

for his Paper on the Investigation of the Orbits of Revolving Double Stars; and to

PROFESSOR AUGUSTE PYRAME DE CANDOLLE, of Geneva, Foreign Member
of the Royal Society,

for his Discoveries and Investigations in Vegetable Physiology.

Those for 1834 were awarded to

JOHN WILLIAM LUBBOCK, Esq., V.P. & TREAS. R.S.,

for his Papers on the Tides published in the Philosophical Transactions; and to

CHARLES LYELL, Esq.,

for his Work entitled "Principles of Geology."

The Council propose to give one of the Royal Medals in the year 1837 to the most important unpublished paper in Physics, communicated to the Royal Society for insertion in their Transactions, after the present date and prior to the month of June in that year.

The Council also propose to give one of the Royal Medals in the year 1837 to the author of the best paper, to be entitled "Contributions towards a System of Geological Chronology founded on an examination of fossil remains, and their attendant phenomena," such paper to be communicated to the Royal Society after the present date and prior to the month of June 1837.

C O N T E N T S.

- XIV. *On some Elementary Laws of Electricity.* By W. SNOW HARRIS, Esq. F.R.S. &c. page 213
- XV. *On a General Method in Dynamics; by which the Study of the Motions of all free Systems of attracting or repelling Points is reduced to the Search and Differentiation of one central Relation, or characteristic Function.* By WILLIAM ROWAN HAMILTON, Member of several scientific Societies in the British Dominions, and of the American Academy of Arts and Sciences, Andrews' Professor of Astronomy in the University of Dublin, and Royal Astronomer of Ireland. Communicated by Captain BEAUFORT, R.N. F.R.S. 247
- XVI. *An Investigation of the Laws which govern the Motion of Steam Vessels, deduced from Experiments.* By PETER W. BARLOW, Esq. Civil Engineer. Communicated by PETER BARLOW, Esq. F.R.S. 309
- XVII. *On the Generation of the Marsupial Animals, with a Description of the Impregnated Uterus of the Kangaroo.* By RICHARD OWEN, Esq., M.R.C.S. and Assistant Conservator of the Museum of the Royal College of Surgeons, London. Communicated by Sir ANTHONY CARLISLE, F.R.S. 333
- XVIII. *Some Observations on the Structure and Functions of tubular and cellular Polypi, and of Ascidiae.* By JOSEPH JACKSON LISTER, Esq. F.R.S. . . . 365
- XIX. *On the Nervous System of the Sphinx ligustri, LINN., (Part II.) during the latter stages of its Pupa and its Imago state; and on the Means by which its Development is effected.* By GEORGE NEWPORT, Esq. Communicated by P. M. ROGET, M.D. Sec. R.S. 389
- XX. *Experimental Researches in Electricity.—Eighth Series.* By MICHAEL FARADAY, D.C.L. F.R.S. Fullerian Prof. Chem. Royal Institution, Corr. Memb. Royal and Imp. Acadd. of Sciences, Paris, Petersburg, Florence, Copenhagen, Berlin, &c. 425
- XXI. *On the Functions of some parts of the Brain, and on the relations between the Brain and Nerves of Motion and Sensation.* By Sir CHARLES BELL, F.R.S. 471
- XXII. *On the repulsive Power of Heat.* By the Rev. BADEN POWELL, M.A. F.R.S. Savilian Professor of Geometry in the University of Oxford 485

XXIII. <i>On the Equilibrium of a Mass of Homogeneous Fluid at liberty.</i> By JAMES IVORY, K.H. M.A. F.R.S. Instit. Reg. Sc. Paris. Corresp., et Reg. Sc. Götting. Corresp.	page 491
XXIV. <i>Observations on the Torpedo, with an account of some additional Experiments on its Electricity.</i> By JOHN DAVY, M.D. F.R.S. Assistant Inspector of Army Hospitals. Communicated by Sir JAMES McGRIGOR, Bart. F.R.S. Director General of the Army Medical Department	531
XXV. <i>Some Remarks in reply to Dr. DAUBENY's Note on the Air disengaged from the Sea over the Site of the recent Volcano in the Mediterranean.</i> By JOHN DAVY, M.D. F.R.S. Assistant Inspector of Army Hospitals	551
XXVI. <i>On the Ova of the Ornithorhynchus paradoxus.</i> By RICHARD OWEN, Esq. Assistant Conservator of the Museum of the Royal College of Surgeons in London. Communicated by Sir ANTHONY CARLISLE, F.R.S.	555
XXVII. <i>Observations on the Motions of Shingle Beaches.</i> By HENRY R. PALMER, Esq. F.R.S. Civil Engineer	567
XXVIII. <i>Analysis of the Moira Brine Spring near Ashby-de-la-Zouche, Leicestershire; with Researches on the Extraction of Bromine.</i> By ANDREW URE, M.D. F.R.S.	577
XXIX. <i>An Account of some Experiments to measure the Velocity of Electricity and the Duration of Electric Light.</i> By CHARLES WHEATSTONE, Esq. Professor of Experimental Philosophy in King's College, London. Communicated by MICHAEL FARADAY, Esq. F.R.S. &c.	583
<i>Index</i>	593

ERRATA.

Phil. Trans. 1833.—page 756, line 6, *for* excreting *read* secreting
page 759, line 25, *for* (Plate XXI.) *read* (Plate XXIII.)